I. Amendments to the Claims

The listing of claims below will replace all prior versions and listings of claims in the application.

The invention claimed is:

1-11. Cancelled

12. (Currently Amended) A refractive ophthalmic treatment method comprising:

receiving pre-operative data concerning a cornea on which the treatment will be performed;

subtracting a programmed optical zone correction from corneal measurements provided in the pre-operative data to provide a predicted location of a post-operative optical zone edge;

calculating a predicted curvature of the cornea at the edge of the optical zone, near the edge of the optical zone, or combinations thereof after application of the programmed optical zone correction;

calculating a customized transition zone pattern which addresses curvature discontinuity by eliminating its occurrence in the programmed optical zone, near the programmed optical zone, or combinations thereof,

wherein ~~said~~ calculation of the customized transition zone pattern is based, at least in part, on the pre-operative data received and the predicted curvature of the cornea, and

wherein ~~said~~ calculation of the customized transition zone pattern involves use of a curve fitting algorithm to generate a transition zone with a continuous second derivative along a profile of the cornea outwardly from the programmed optical zone correction;

applying the customized transition zone pattern to a designed ablation zone pattern to provide an updated ablation zone pattern,

wherein corrective properties of the ~~continuously curved~~ customized transition zone pattern are included in the updated ablation zone pattern to facilitate an increased functional optical zone; and

performing an ablation on the cornea based on the updated ablation zone pattern.

13. (Original) The method of claim 12 wherein said pre-operative data, in part, is used to determine a programmed optical zone correction used in the ablation zone pattern.

14. (Currently Amended) The method of claim 12 wherein said pre-operative data includes, at least one of topographic data, pachymetric data, elevation data, corneal thickness data, corneal curvature data, wave-front data, and intraocular pressure data, wherein such data is associated with the cornea before and/or after a pre-operative perturbation.

15. (Currently Amended) The method of claim 14 wherein ~~said~~the perturbation comprises one of a corneal incision, a corneal ablation, a LASIK flap cut, an ultrasonic measurement, and peeling the epithelial layer from the cornea.

16. (Cancelled)

17. (Currently Amended) The method of claim 12 wherein ~~said~~use of a curve fitting algorithm comprises curve fitting ~~is~~ selected from the group comprising ~~one of~~ spline fitting, arc-step fitting, least-squares fitting, and non-linear least squares fitting.

18. (Original) The method of claim 12 further comprises receiving post-perturbation data which includes, at least one of topographic data, pachymetric data, elevation data, corneal thickness data, corneal curvature data, wave-front data, and intraocular pressure data, where such data is associated with the cornea after perturbation.

19. (Original) The method of claim 18 wherein said perturbation comprises one of a corneal incision, a corneal ablation, a LASIK flap cut, an ultrasonic measurement, and peeling the epithelial layer from the cornea.

20. (Original) The method of claim 12 further comprises taking corneal measurements, which are taken by methods including, but not limited to, corneal topography, optical coherence tomography, ultrasound, refraction, and/or wave-front analysis.